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## Appendix B

### Site Descriptions for Primary Inventory Locations

Aquatics are addressed in Appendix C.

#### BER Primary Inventory Sites Within the Lower Wolf River Bottomlands Natural Resources Area

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## Primary Site Descriptions of the Lower Wolf River Bottomlands Area

This section contains site descriptions, an assessment of site significance, and inventory and management considerations for surveyed sites, including all or portions of the 14 state-owned properties within the Lower Wolf River Bottomlands Natural Resources Area and 10 additional privately owned sites. Map 10 depicts each of the 24 final inventory sites. Six new sites have been added since the release of the interim report (WDNR 2000) and several of the former site boundaries have changed as a result of inventories conducted in 2000 and 2001. Generally, these descriptions describe only the natural communities or habitats within and/or around the property. Because each was not exhaustively surveyed (e.g. old agricultural land, reed canary grass stands, very small and highly disturbed vegetation patches were typically not surveyed), the site descriptions are preliminary and do not represent complete descriptions of each property. Thus, adequate information was not available for all sites to develop management considerations. Refer to the main body of the report for a more detailed discussion of site selection.

Over 30 occurrences of natural communities were surveyed within these 24 sites. Significant findings within any site are highlighted as appropriate within the site description. Management considerations for individual plant and animal species are provided in Appendices O and P.

Each inventory site description is organized in three sections:

**Site Description:** describes the location, existing natural features, surrounding land uses, and some of the past management activities.

**Site Significance:** significance can include extent, condition, and type of important natural communities, successional stages or habitats, rare or otherwise noteworthy species, existing land use designations, and overall significance at both the local and regional levels.

**Management Considerations:** describes the management considered relevant for master planning or other planning efforts to protect, maintain and enhance the important features of the site. Development of these considerations included:

- identifying those processes or actions needed to maintain the integrity of ecosystems and ecosystem complexes and rare species present.
- identifying potential impacts from natural disturbances, human use, and development pressure.
- highlighting the importance of selecting the most appropriate land use classifications or designations for each site via the master planning process.

Within each site description, discrepancies may exist between the rare species mentioned in the site narratives and those listed in the site tables. For example, a site narrative may mention the presence of a rare plant or animal, but the species is not included in the site table. This can occur for the following reasons:

1. Certain rare plants and animals are disturbance sensitive or vulnerable to exploitation and these records were deleted from the table and/or descriptions.
2. Locations of some species, particularly animals, may be generalized in the NHI database and did not always show up within our site survey polygon boundaries. An example is a species with high mobility, such as timber wolf.
3. Also, several long river segments are described in Appendix C as Priority Stream Segments. Some of the Priority Stream Segments flow through Primary Inventory Sites and there will be overlap between the tables of associated species in both appendices, especially for riverine animals. Reference to Appendix C is provided in these descriptions as appropriate.

# 1. Navarino State Wildlife Area

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T25N-R 15E sec. 11-14, 23, 24; T25N-R 16E sec. 01-18, 20, 21, 24;  
T25N-R 17E sec. 06; T26N-R 16E sec. 25-27, 34-36; T26N-R 17E sec. 31  
Size: 17,604 acres

## **Site Description**

Located in southeastern Shawano County and northeastern Waupaca County between the Wolf and Shioc rivers, Navarino has nearly level terrain, with shallow depressions and low sandy ridges providing most of the topographic relief. Navarino is surrounded by agricultural lands, and scattered, usually small, forest remnants. The Wolf River floodplain occurs along the western edge of the site while the Shioc River meanders along the eastern border.

The Shioc River area consists mostly of a logged floodplain forest of silver maple, swamp white oak, and green ash. The Wolf River floodplain contains a similar but much more extensive forest, also composed of silver maple, swamp white oak, and green ash. The condition of natural communities within the Wildlife Area is generally good, while the condition is more variable on adjacent private property.

Extensive wetland communities of varying quality occupy much of the area between the two rivers. Wetland communities or cover types include emergent and submergent marshes, tamarack swamp, shrub-carr, semi-open swamp/meadow, wet-mesic red maple-white cedar swamp, sedge meadow, poor fen, and reed canary grass meadow. The sedge meadow and tamarack swamp communities are of especially high significance because of their generally good condition.

The low sandy uplands include open, formerly disturbed areas, such as abandoned fields and sand pits, that now support recovering or re-created barrens-sand prairie communities. Several old fields have been reclaimed and planted to re-create stands of sand prairie. The forested uplands support thickets of aspen as well as significant stands of relatively undisturbed, mature dry-mesic forest of white pine, red oak, red maple, aspen, and paper birch. There are also a few patches of more mesic forest composed of red oak, white pine, red maple, and hemlock that support colonies of the regionally restricted Indian cucumber root (*Medeola virginiana*). There are also short sections of free flowing streams and several springs that are worthy of special management consideration and protection.

Also see Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site.

## **Site Significance**

Navarino SWA encompasses a large acreage that contains significant occurrences of several natural communities, including floodplain forest, sedge meadow, emergent marsh, and dry-mesic forest. Many rare species were documented here, including several that are state-listed as threatened or endangered (see table below). The boggy wetland in particular was considered unique for east-central Wisconsin in that it supports 31 aquatic invertebrate species, nearly half of which are new county records, and many of the species collected were at their northern or southern range limits.

Below Navarino, the extensive forested floodplain of the Wolf is relatively undeveloped and also supports significant natural communities and many sensitive species. The dry, more open, uplands provide valuable habitat for grasshoppers, Lepidoptera, ant lions, tiger beetles, and other insects associated with open sand habitats. Breeding season records for several rare grassland bird species, e.g., Henslow's

Sparrow, were also obtained. Very few stands of mature white pine-hardwood forest were identified anywhere in the lower basin.

## Management Considerations

Because of the size, context, content, and ownership of this site, Navarino has high potential for the management or restoration of many natural communities and sensitive species. Natural communities with high management potential include floodplain forest, northern dry-mesic forest, sedge meadow, marsh, and sand prairie. From the standpoint of offering additional protection to some of the more sensitive forest dwelling species, e.g., birds, it is desirable to maintain large patches of mature forest with high canopy closure, especially within the corridor of the Wolf River.

Navarino and several of the other public and private lands along the lower Wolf constitute opportunities of critical importance to conserving the native biodiversity of the basin.

## NAVARINO STATE WILDLIFE AREA EO's

Scientific Name	Common Name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1991
<i>Agabus bicolor</i>		SC/N		1999
<i>Agabus wasastjernae</i>	Predaceous diving beetle	SC/N		2000
<i>Alasmidonta marginata</i>	Elktoe	SC/H		1995
<i>Ammodramus henslowii</i>	Henslow's sparrow	THR		2000
<i>Baetisca obesa</i>	A mayfly	SC/N		1999
<i>Botaurus lentiginosus</i>	American bittern	SC/M		2000
<i>Buteo lineatus</i>	Red-shouldered hawk	THR		2000
<i>Celina hubbelli</i>	a predaceous diving beetle	SC/N		1999
<i>Chlidonias niger</i>	Black tern	SC/M		2000
<i>Cicindela lepida</i>	Little white tiger beetle	SC/N		2000
<i>Cicindela patruela huberi</i>	A tiger beetle	SC/N		2000
<i>Cicindela patruela patruela</i>	A tiger beetle	SC/N		2000
<i>Clemmys insculpta</i>	Wood turtle	THR		1989
<i>Copelatus glyphicus</i>	Predaceous diving beetle	SC/N		2000
<i>Cymbiodyta minima</i>	A water scavenging beetle	SC/N		1999
<i>Dubiraphia bivittata</i>	A dubiraphia riffle beetle	SC/N		1999
<i>Emydoidea blandingii</i>	Blanding's turtle	THR		2000
<i>Enochrus consortus</i>	A water scavenging beetle	SC/N		2000
<i>Enochrus perplexus</i>	A water scavenger beetle	SC/N		2000
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Etheostoma clarum</i>	Western sand darter	SC/N		1994
<i>Euphyes dion</i>	Dion skipper	SC/N		2000
<i>Gallinula chloropus</i>	Common moorhen	SC/M		2001
<i>Graphoderus manitobensis</i>	a predaceous diving beetle	SC/N		1999
<i>Haliaeetus leucocephalus</i>	Bald eagle	SC/FL	LT,PDL	1989
<i>Helocombus bifidus</i>	A water scavenging beetle	SC/N		1999
<i>Hesperia leonardus leonardus</i>	Leonard's skipper	SC/N		2000
<i>Hesperocorixa semilucida</i>	A water boatman	SC/N		1999
<i>Hydrometra martini</i>	A water measurer	SC/N		1999
<i>Hydroporus badiellus</i>	A predaceous diving beetle	SC/N		1999
<i>Hydropsyche bidens</i>	A caddisfly	SC/N		1999
<i>Ilybius discedens</i>	A predaceous diving beetle	SC/N		1999
<i>Ilybius ignarus</i>	Diving beetle	SC/N		1999
<i>Ilybius incarinatus</i>	A predacious diving beetle	SC/N		2000
<i>Ixobrychus exilis</i>	Least bittern	SC/M		2000
<i>Lepomis megalotis</i>	Longear sunfish	THR		1926
<i>Moxostoma carinatum</i>	River redhorse	THR		1981
<i>Neurocordulia yamaskanensis</i>	Stygian shadowfly	SC/N		1999
<i>Ophiogomphus howei</i>	Pygmy snaketail	THR		1999
<i>Opsopoeodus emiliae</i>	Pugnose minnow	SC/N		1973
<i>Pandion haliaetus</i>	Osprey	THR		2001

Scientific Name	Common Name	State Status	Federal Status	Lastobs Date
<i>Paracloeodes minutus</i>	A small minnow mayfly	SC/N		1992
<i>Pelocoris femorata</i>	A creeping water bug	SC/N		1999
<i>Plautius cestus</i>	A small minnow mayfly	SC/N		1999
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Poanes massasoit</i>	Mulberry wing	SC/N		2000
<i>Poanes viator</i>	Broad-winged skipper	SC/N		2000
<i>Protonotaria citrea</i>	Prothonotary warbler	SC/M		2000
<i>Rhantus sinuatus</i>	A predaceous diving beetle	SC/N		2000
<i>Simpsonaias ambigua</i>	Salamander mussel	THR		1989
<i>Spharagemon marmorata</i>	Northern marbled locust	SC/N		1999
<i>Stenelmis bicarinata</i>	A riffle beetle	SC/N		1999
<i>Stenelmis fuscata</i>	A riffle beetle	SC/N		1999
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Plants				
<i>Medeola virginiana</i>	Indian cucumber-root	SC		1999
Communities				
Floodplain forest		NA		2000
Northern dry-mesic forest		NA		1999
Northern sedge meadow		NA		2000
Sand prairie		NA		1999
Spring pond		NA		1981
Stream—fast, hard, cold		NA		1981

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 2. Leeman Bottoms

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T25N-R15E-sections 23-26, 36  
T25N-R16E-sections 30, 31, 32  
T24N-R16E-sections 4, 5,  
Size: 4,586 acres

### **Site Description**

Just to the north and east of the border junction of Shawano, Waupaca, and Outagamie counties, Leeman Bottoms encompasses a 5 mile stretch of the Wolf River floodplain from the bridge crossing at State Highway 156 downstream to County Highway 'C'. The river floodplain is approximately 1 mile wide throughout most of this site. The primary natural community is a lowland hardwood forest composed of silver maple, swamp white oak, and green ash. Representative understory species include many native lowland forest grasses and sedges, wood nettle, false nettle, gray-headed coneflower, green dragon, jumpseed, and cardinal flower.

Characteristic birds noted in association with the lowland forest included American Redstart, Pileated Woodpecker, Yellow-throated Vireo, Brown Creeper, Great-crested Flycatcher, Hooded Merganser, Wood Duck, and Barred Owl.

A number of running and cut-off sloughs are present. These support stands of emergent and submergent aquatic macrophytes and small patches of shrub swamp and sedge meadow. Also, see Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site.

### **Site Significance**

This site contains significant stands of mature floodplain forest, which in places exhibit old-growth characteristics. Limited surveys on foot were conducted here, but the entire corridor, including the backwater sloughs, was canoed during the month of June and yielded breeding season records for rare birds such as Red-shouldered Hawk, Cerulean Warbler, and Prothonotary Warbler at multiple locations. The state-threatened Blanding's turtle is also present, as are many rare aquatic species including fish, mussels, and insects.

An oxbow pond sampled for aquatic invertebrates produced "an amazing mass of invertebrates". Large Lestid damselflies dominated, but other large invertebrates were also abundant, including the rare freshwater shrimp. Species diversity was considered astounding for the limited sampling effort made. Fish are present here, but apparently do not limit invertebrate diversity and production in this case.

### **Management Considerations**

Most of this site is privately owned and may be subject to development or ill-advised logging. Heavily logged areas in the eastern half of section 32 and in the northeastern quarter of section 5 are now heavily overrun with dense stands of the highly invasive and vexingly persistent reed canary grass. Little re-growth of trees was occurring in these infested areas. Purple loosestrife is present but uncommon at scattered locations along the banks of the main stem. Several cottages were constructed recently on slightly elevated terraces near the river. Shoreline rip-rapping and the replacement of native vegetation by lawns has accompanied some of this development.

The more intact floodplain communities should be a high priority for protection. The extent of relatively undisturbed forest was significantly greater in the late 1970s, when the Scientific Areas section of WDNR's Bureau of Research conducted preliminary inventory work in the vicinity. The entire river corridor is important, and even the highly disturbed forest in the southern part of the site should be considered for remedial restoration activities.

### LEEMAN BOTTOMS EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1991
<i>Agabates acuductus</i>	A hydrophilid beetle	SC/N		2000
<i>Alasmidonta marginata</i>	Elktoe	SC/H		1999
<i>Buteo lineatus</i>	Red-shouldered hawk	THR		2000
<i>Dendroica cerulea</i>	Cerulean warbler	THR		2000
<i>Emydoidea blandingii</i>	Blanding's turtle	THR		1980
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Etheostoma clarum</i>	Western sand darter	SC/N		1994
<i>Hebrus buenoi</i>	A velvet waterbug	SC/N		2000
<i>Hydrometra martini</i>	A water measurer	SC/N		2000
<i>Lestes inaequalis</i>	Elegant spreadwing	SC/N		2000
<i>Moxostoma carinatum</i>	River redhorse	THR		1981
<i>Nepa apiculata</i>	A water scorpion	SC/N		2000
<i>Notropis texanus</i>	Weed shiner	SC/N		1981
<i>Opsopoeodus emiliae</i>	Pugnose minnow	SC/N		1973
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Procambarus acutus</i>	White river crawfish	SC/N		2000
<i>Protonotaria citrea</i>	Prothonotary warbler	SC/M		2000
<i>Pseudiron centralis</i>	A heptageniid mayfly	SC/N		2000
<i>Simpsonaias ambigua</i>	Salamander mussel	THR		1999
<i>Stylurus notatus</i>	Elusive clubtail	SC/N		1980
<i>Triaenodes nox</i>	A caddisfly	SC/N		2000
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Plants				
<i>Medeola virginiana</i>	Indian cucumber-root	SC		2001
Communities				
	Floodplain forest	NA		2000
	Northern sedge meadow	NA		2000
	Northern wet-mesic forest	NA		2001
	Southern mesic forest	NA		2000

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

### 3. Deer Creek State Wildlife Area

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T24N-R15E sec. 01-03, 11; T25N-R 15E sec. 34, 35  
Size: 2,017 acres

#### Site Description

Located on the border of Outagamie and Waupaca counties, this site is situated about midway between the Wolf and Embarrass rivers. The SWA is bordered primarily by agricultural lands with small fragments of disturbed natural communities around the periphery. The south-central portion of the site was formerly a mint farm.

Remnant natural communities of ecological significance include tamarack-black spruce swamp and muskeg-open bog, associated with relatively small stands of southern sedge meadow, shrub-carr, emergent aquatic, and submergent aquatic. The majority of Deer Creek SWA is an unnaturally dry wetland because it is drained by a large “+” shaped ditch system. Reed canary grass has invaded the site and is established in several of the open wetland communities.

The uplands consist of low, broad to narrow ridges and plains. Open areas are primarily abandoned farms and quarries. The forested portions have been heavily logged and are disturbed. There are a few fragments of somewhat less disturbed forest which support colonies of Indian cucumber-root (*Medeola virginiana*). Some open sand habitat, perhaps created by human disturbance, was planted to prairie twelve years ago. Grasses appear to be crowding out insects that inhabit patches of open sand.

#### Site Significance

This property contains examples of several natural communities of moderate quality and provides secure habitat for many common native plants and animals. “Northern” peatland communities are generally uncommon anywhere in the lower Wolf basin. The clam shrimp *Lycneus brachyunis* was found here and at one other site in the Lower Wolf River Bottomlands Natural Resources Area. These collections constitute a new state record. This species may be added to the Wisconsin Special Concern list in the future.

#### Management Considerations

The majority of this site is owned and managed by the WDNR as Deer Creek State Wildlife Area. Potential for natural community management and restoration is limited at this time by past ditching, agricultural impacts, infestations of reed canary grass, and other disturbances, but the peatland types are relatively intact, uncommon in this part of the Wolf basin, and important components of this landscape’s community mosaic.

#### DEER CREEK WILDLIFE AREA EO’s

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Emydoidea blandingii</i>	Blanding's turtle	THR		1992
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Trachyrhachys kiowa</i>	Ash-brown grasshopper	SC/N		1999
Plants				
<i>Medeola virginiana</i>	Indian cucumber-root	SC		1995
Communities				
Open bog		NA		1999



Scientific Name	Common name	State Status	Federal Status	Lastobs Date
	Tamarack (poor) swamp	NA		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 4. Embarrass River - CTH XX to CTH F

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T24N-R15E-sections 4, 5, 9, 10, 15, 16, 21, 22, 26, 27, and 27  
Size: 2,314 acres

### Site Description

This site consists of a 5 mile stretch of the Embarrass River in northwestern Outagamie County from the bridge crossing at County Highway `XX` downstream to the bridge at County Highway `F`. The floodplain varies in width but is generally between one-quarter and one-half mile wide. The primary community is a continuous strip of floodplain forest composed mostly of silver maple, swamp white oak, and green ash. Hackberry, basswood, American elm, and bitternut hickory are among the common or widespread canopy associates. Characteristic understory plants include wood nettle, false nettle, fowl manna grass, tall bellflower, sensitive fern, green dragon, cardinal flower, hop sedge, and Tuckerman's sedge.

Patches of emergent marsh occur in some of the protected backwaters. These consist of arrowheads, soft-stem bulrush, river bulrush, lake sedge, cattails, and bur-reeds. Most of the emergent stands are rather small, seldom exceeding 10 acres. Submergent macrophyte beds are also present, composed of species such as coontail, waterweed, various pondweeds, and white water crowfoot.

The uplands bordering the floodplain are used intensively for agriculture throughout this stretch. See Appendix C. Stream Priority # 3 for additional description of riverine features associated with this site.

### Site Significance

This site contains several good quality stands of mature floodplain forest and emergent marsh and provides the only extensive habitat available in the local landscape for many native plants and animals. Several rare animals were documented in the floodplain forest community and in the river itself.

### Management Considerations

All lands at this site are privately owned. Maintenance of larger patches of intact forest is an important consideration here, as the floodplain becomes very narrow to the north and diking and ditching has been extensive within the floodplain to the south. Invasive species that occur at scattered locations here and could easily spread further include reed canary grass, purple loosestrife, and curly pondweed. Maintaining the native floodplain vegetation is an important water quality consideration along this intensively cultivated stretch of the Embarrass River.

### Embarrass River - CTH XX to CTH F EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1991
<i>Buteo lineatus</i>	Red-shouldered hawk	THR		2000
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Pseudiron centralis</i>	A heptageniid mayfly	SC/N		1999
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Communities				
Floodplain forest		NA		2000

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 5. Maine State Wildlife Area

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T24N-R 16E sec. 14, 15, 22  
Size: 1,632 acres

### Site Description

Located in northwestern Outagamie County, this SWA consists of extensive wetlands on nearly level topography with scattered low, narrow upland ridges. A privately-owned area of similar size, vegetation, and topography borders the site to the northeast. The entire complex is surrounded by agricultural land.

The dominant wetland community is a semi-open to open meadow/shrub swamp of sedges, reed canary grass, bluejoint grass, willow, poison sumac, alder, and cattail, with scattered young tamarack, red maple, American elm, and ash. There are a few small patches where tamarack is locally dominant. The low ridges are vegetated with logged over mesic to wet-mesic forests of aspen, red maple, paper birch, basswood, green ash, red oak, bur oak, white oak, and sugar maple.

### Site Significance

Several rare to uncommon species of aquatic macroinvertebrates including a very rare water scavenger beetle were found in the swamp. Total aquatic invertebrate diversity was considered very good for a habitat of this type. The site provides secure habitat for many common native plants and animals.

### Management Considerations

Enhancing the wetlands by restoring site hydrology where feasible and allowing patches of tamarack and swamp hardwood forest to mature are considerations for this property. The adjoining private property of similar topography, vegetation, and size to the northeast may be worthy of additional inventory and protection.

### MAINE STATE WILDLIFE AREA EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Celina hubbelli</i>	A predaceous diving beetle	SC/N		1999
<i>Cymbiodyta acuminata</i>	A water scavenger beetle	SC/N		1999
<i>Enochrus consortus</i>	A water scavenging beetle	SC/N		1999
<i>Laccobius agilis</i>	A water scavenging beetle	SC/N		1999
<i>Liodessus cantralli</i>	Cantrall's bog beetle	SC/N		1999
<i>Rhantus sinuatus</i>	A predaceous diving beetle	SC/N		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 6. Maine Bottoms

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T24N-R16E-sections 8, 9, 16, 17, 21, 28, and 29  
Size: 2,044 acres

### ***Site Description***

Maine Bottoms includes a segment of the Wolf River floodplain in northwestern Outagamie County. The north end of the site is the County Highway 'F' bridge across the Wolf. The southern boundary is the northern edge of Outagamie State Wildlife Area approximately 4 miles downstream. The site is contained within the floodplain of the Wolf River, which averages roughly 1 mile in width. The river is bordered by lowland hardwood forest dominated by silver maple, green ash, and swamp white oak. Understory composition is typical for the lower Wolf, and includes buttonbush, winterberry holly, wood nettle, false nettle, ostrich fern, sensitive fern, cardinal flower, green dragon, jumpseed, fowl manna grass, and many native sedges.

Patches of emergent and submergent marsh are also present. Characteristic plants are cattails, bulrushes, arrowheads, lake sedge, coontail, white water crowfoot, waterweed, and several pondweeds. Stands of marsh immediately adjacent to the river are generally small, though some larger patches are present in the extensive wetland complex to the west.

The adjoining uplands are almost totally dedicated to agricultural production. See Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site.

### ***Site Significance***

This site encompasses an important and unprotected segment of the highly significant lower Wolf River corridor (see Appendix C.). Though logging has occurred at one time or another in most stands, there are areas of mature forest with large trees and high canopy closure. Rare species were documented in these habitats, including the Prothonotary Warbler and wood turtle. Additional rare species occur as part of the aquatic biota.

### ***Management Considerations***

Protection of the river corridor and adjacent floodplain forest is needed to provide secure habitat for the more sensitive species present. A change in local logging practices is desirable, as some of the more heavily cut stands are now badly infested with dense growths of the highly invasive reed canary grass. Other invasive species should be monitored and controlled as appropriate and feasible.

This site is entirely in private ownership, but some of the more intact forest is contiguous with Outagamie State Wildlife Area. Maine State Wildlife Area is only one-quarter mile to the east, but connection would be very difficult owing to the location of state highway 187 and the predominantly agricultural use of the lands between the Wildlife Area and the Wolf River floodplain.

## MAINE BOTTOMS EO'S

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1991
<i>Alasmidonta marginata</i>	Elktoe	SC/H		1995
<i>Clemmys insculpta</i>	Wood turtle	THR		2000
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Etheostoma clarum</i>	Western sand darter	SC/N		1994
<i>Notropis texanus</i>	Weed shiner	SC/N		1981
<i>Opsopoeodus emiliae</i>	Pugnose minnow	SC/N		1973
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Protonotaria citrea</i>	Prothonotary warbler	SC/M		2000
<i>Simpsonaias ambigua</i>	Salamander mussel	THR		1989
<i>Stylurus notatus</i>	Elusive clubtail	SC/N		1999
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Communities				
Floodplain forest		NA		2000

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 7. Wolf River Wetlands

Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T24N-R 15E sec. 24, 25, 36; T24N-R 16E sec. 19, 30, 31  
Size: 3,366 acres

### Site Description

Located in northwestern Outagamie County, this site is located midway between the Wolf and the Embarrass rivers, and is generally congruent with the boundary of Wolf River Bottoms-K&S Unit- State Wildlife Area. This site's topography is low and nearly level, with scattered low sandy ridges. The vegetation and hydrology have been altered by heavy logging and extensive waterfowl management projects. County Highway M passes along the east edge, where some residential development exists. An area of similar topography and vegetation borders the site to the north, and agricultural lands border it to the west.

Wetland communities present include emergent aquatic marsh, shrub-carr, alder thicket, reed canary grass meadow, and hardwood swamp. The uplands have, for the most part, been cleared. The forested areas are predominantly young aspen thickets. There are several small fragments of formerly pastured, selectively logged mesic forest of sugar maple-basswood-red oak-aspen-red maple-paper birch in the northeast corner of the site. Several upland prairie plantings also exist. The management emphasis is to promote waterfowl habitat. See Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site.

### Site Significance

This site contains communities of moderate quality that provide secure habitat for many common native plants and animals that inhabit marshes, shrub swamps and younger forests. Several rare species were also documented here, including marsh birds such as the King Rail and Least Bittern.

### Management Considerations

No management modifications are recommended at this time. The hydrology has been affected by the extensive ditching conducted here in the past, and roads surround and at least partially isolate the site.

### WOLF RIVER WETLANDS EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Botaurus lentiginosus</i>	American bittern	SC/M		2000
<i>Emydoidea blandingii</i>	Blanding's turtle	THR		2000
<i>Enochrus consortus</i>	A water scavenging beetle	SC/N		1999
<i>Euphyes dion</i>	Dion skipper	SC/N		1990
<i>Gallinula chloropus</i>	Common moorhen	SC/M		2001
<i>Haliphus canadensis</i>	A crawling water beetle	SC/N		1999
<i>Hydrometra martini</i>	A water measurer	SC/N		1999
<i>Ixobrychus exilis</i>	Least bittern	SC/M		2000
<i>Poanes viator</i>	Broad-winged skipper	SC/N		2000
<i>Rallus elegans</i>	King rail	SC/M		2000
Communities				
Southern mesic forest		NA		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 8. Outagamie Bottoms

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T23N-R 16E sec. 04, 05, 08, 09; T24N-R 16E sec. 32, 33  
Size: 2,338 acres

### Site Description

Located in northern Outagamie County, this site encompasses the Wolf River corridor from the northern boundary of Outagamie County State Wildlife Area south to the village of Shiocton. Both units of the SWA are included but ecologically significant floodplain habitats extend well beyond the SWA boundaries along the Wolf River. The floodplain narrows appreciably near Shiocton and is bordered by agricultural land and residential developments.

The floodplain forest community is composed of silver maple, swamp white oak, and green ash. Condition is variable, but several mature stands are present. There are also several relatively undisturbed stands of emergent marsh (bulrushes, bur-reeds, sedges) and sedge meadow, though the continued encroachment by the highly invasive reed canary grass is problematic. Some of the wetlands within the northern portion of the SWA have been altered by dike and ditch construction to benefit waterfowl. These areas are now vegetated with wild rice, cattail, bulrushes, sedges, willows, dogwoods, and reed canary grass. Small thickets of lowland aspen also occur here. See Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site.

### Site Significance

This site occupies a strategic location within the highly significant Wolf River corridor. Rare species that are resident here include the state-threatened Cerulean Warbler, Red-shouldered Hawk, and Wood Turtle, and the site provides secure habitat for many common and characteristic plants and animals as well.

### Management Considerations

Extending protection south to Shiocton would benefit several sensitive forest animals, as would provision for a core area of older forest with high canopy closure within the SWA. Invasive species should be monitored and controlled as feasible.

### OUTAGAMIE BOTTOMS EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1991
<i>Alasmodonta marginata</i>	Elktoe	SC/H		1995
<i>Botaurus lentiginosus</i>	American bittern	SC/M		2000
<i>Clemmys insculpta</i>	Wood turtle	THR		2000
<i>Dendroica cerulea</i>	Cerulean warbler	THR		2000
<i>Emydoidea blandingii</i>	Blanding's turtle	THR		2000
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Etheostoma clarum</i>	Western sand darter	SC/N		1994
<i>Euphyes dion</i>	Dion skipper	SC/N		2000
<i>Ixobrychus exilis</i>	Least bittern	SC/M		2000
<i>Notropis texanus</i>	Weed shiner	SC/N		1981
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Poanes massasoit</i>	Mulberry wing	SC/N		2000
<i>Poanes viator</i>	Broad-winged skipper	SC/N		2000
<i>Protonotaria citrea</i>	Prothonotary warbler	SC/M		2000
<i>Simpsonia ambigua</i>	Salamander mussel	THR		1989
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995



Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Communities				
Emergent aquatic		NA		1999
Emergent aquatic - wild rice		NA		1999
Floodplain forest		NA		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 9. Mack State Wildlife Area

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T23N-R 16E sec. 13, 14, 23, 24  
Size: 2,730 acres

### Site Description

This Wildlife Area is located in central Outagamie County and is surrounded by agricultural and abandoned agricultural land, with the exception of bordering wetlands to the south and a large wetland to the southeast. A 3/4 square mile property owned by the Wisconsin Department of Transportation (WIDOT) as a wetland mitigation site borders the SWA and has been included within the site boundary.

Mack SWA is nearly level site consisting of ditched wetlands bisected by a railroad and Highway 54. The predominant community is a young, dense, moist aspen stand. Open to semi-open areas are composed primarily of reed canary grass, sedges, and willows. There is a semi-open cottonwood-willow swamp on the eastern end of the property. South of the railroad there is a logged over red maple-ash-elm forest; an open meadow/shrub swamp of willow, reed canary grass, sedge, and cattail; and a white cedar, red maple, basswood swamp forest with altered drainage. The WIDOT property is reclaimed agricultural land that is dominated by cattail and reed canary grass, with willow in some areas. The area is ditched and some of the ditches are impounded to create additional habitat for waterfowl and other marsh species.

### Site Significance

This site contains recovering examples of several natural communities and provides secure habitat for many common native plants and animals. Several rare birds inhabit the marshes and grasslands. The area between Nichols Creek and Bear Creek is an important stopover for migrating waterfowl. There is a historical record for the rare showy lady's slipper from this area, but BER botanists could not relocate the species over the course of this project.

### Management Considerations

Natural community management and restoration potential is low due to the disturbed nature of the site, especially from the altered hydrology due to ditching. The large wetland to the southeast is a candidate for inventory and potential protection. Numerous small smoldering fires occurred in the peaty soils in late October 1999 in the northeastern portion of the area.

### MACK STATE WILD LIFE AREA EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Ammodramus henslowii</i>	Henslow's sparrow	THR		2000
<i>Chlidonias niger</i>	Black tern	SC/M		2000
<i>Euphyes dion</i>	Dion skipper	SC/N		1999
<i>Ixobrychus exilis</i>	Least bittern	SC/M		2000
Plants				
<i>Cypripedium Reginae</i>	Showy lady's-slipper	SC		1916
Communities				
Southern hardwood swamp		NA		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 10. Lower Embarrass River Bottoms

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T23N- R15E-sections 10, 11, 14,15, 22, 23, 26, 27, 28, 33, and 34  
Size: 2,150 acres

### Site Description

Lower Embarrass River Bottoms encompasses a 5-mile stretch of the Embarrass River floodplain in northwestern Outagamie County, from the bridge crossing at State Highway 76 downstream to the bridge at Spurr Road. The floodplain is broad in the northern part of the site, approaching a width of almost 2 miles. An area of over 2 square miles on the east side of the river toward the northern end of the site has been extensively ditched and dike to create additional waterfowl habitat.

The river is bordered by a lowland hardwood forest dominated by silver maple, green ash, swamp white oak, and basswood. Common or characteristic understory plants include wood nettle, false nettle, jumpseed, white snakeroot, sensitive fern, ostrich fern, fowl manna grass, white grass, woodland brome grass, and hop sedge.

A stand of relatively undisturbed mesic hardwood forest with a canopy of sugar maple, beech, and basswood occurs on a slightly elevated terrace just above the river floodplain in section 22. Butternut is among the canopy associates. A number of plants near their northern range limits are present, as are several rare species.

The uplands bordering the floodplain are currently almost wholly dedicated to agricultural production. See Appendix C. Stream Priority # 3 for additional description of riverine features associated with this site.

### Site Significance

This site supports several rare species, including plants, birds, and aquatic animals. Several relatively undisturbed natural community occurrences were documented here, including a significant stand of upland hardwood forest. This is one of the very few examples of this type that is not severely affected by past use history or isolation.

### Management Considerations

The lands within this site are entirely in private ownership. Maintenance of the remaining forested floodplain and associated patches of mesic hardwood forest are key considerations. Additional clearing of floodplain forest was occurring in the northwestern part of the site west of the river in 2000.

### LOWER EMBARRASS RIVER BOTTOMS EO's

Scientific name	Common name	State status	Federal status	Last obs date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		UNK
<i>Alasmidonta marginata</i>	Elktoe	SC/H		1995
<i>Buteo lineatus</i>	Red-shouldered hawk	THR		2000
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Hydropsyche bidens</i>	A caddisfly	SC/N		1999

	Scientific name	Common name	State status	Federal status	Lastobs date
	<i>Notropis texanus</i>	Weed shiner	SC/N		1979
	<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
	<i>Stenelmis fuscata</i>	A riffle beetle	SC/N		1999
	<i>Stylurus notatus</i>	Elusive clubtail	SC/N		1999
	<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Plants					
	<i>Carex formosa</i>	Handsome sedge	THR		2001
	<i>Phegopteris hexagonoptera</i>	Broad beech fern	SC		2001
Communities					
	Floodplain forest		NA		2000
	Southern mesic forest		NA		2000

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 11. Hortonville Bog State Natural Area

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Ecoregion: Central Lake Michigan Coastal  
Town-Range-Section: T22N-R 15E sec. 02-04, 09-11, 14-16  
Size: 1,782 acres

### Site Description

Hortonville Bog is a large insular peatland located in west central Outagamie County, two miles east of New London. The central core of the site supports an open muskeg and bog composed of sphagnum mosses, sedges, and ericaceous shrubs with a scattering of stunted tamarack and black spruce. With the exception of a shallow ditch and a few ORV trails, the muskeg is in very good condition.

Away from the center of the peatland tree cover increases significantly, forming a closed canopy conifer forest of tamarack and black spruce.

There are several stands of more calcareous, wet-mesic forest near the peatland margins. White cedar becomes a dominant tree, with tamarack, red maple, and paper birch also present. Past disturbance is more evident here than in the more acid communities closer to the site's interior. Poison sumac is a common tall shrub. This calcareous swamp supports colonies of cuckoo flower (*Cardamine pratensis*), a state special concern plant.

Relatively small stands of alder thicket, shrub-carr, sedge meadow, and hardwood swamp are also present. These communities tend to be disturbed, and infestations of the highly invasive reed canary grass are locally common. Wetlands to the east of the site boundary have been ditched and are in a generally highly disturbed condition.

### Site Significance

Bogs are not common in this part of Wisconsin, and this property was established as a State Natural Area in 1987 to achieve long-term protection for large relatively undisturbed examples of regionally representative peatland communities. Several rare plants and a number of regionally uncommon birds such as the Lincoln's Sparrow and Palm Warbler have been documented here.

### Management Considerations

Protection or restoration of site hydrology is of paramount importance, with primary emphasis focused on the ditched eastern portion of the wetland. Additional buffering around the wetland margins is desirable to reduce high contrast edge and improve the quality of water draining into the wetland interior. Periodic monitoring is needed to assess the status and efficacy of control of invasive species.

### HORTONVILLE BOG STATE NATURAL AREA EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Plants				
<i>Cardamine pratensis</i>	Cuckooflower	SC		1999
<i>Carex gynocrates</i>	Northern bog sedge	SC		1931
Communities				
Northern wet-mesic forest		NA		1999
Open bog		NA		1999
Tamarack (poor) swamp		NA		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 12. LaSage Bottoms

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T22N-R 16E sec. 07, 08, 18  
Size: 1,387 acres

### Site Description

Located to the west of the Wolf River in west central Outagamie County, this site is situated within a matrix composed almost entirely of agricultural lands. The site is contiguous with forested floodplain to the north, south, and east, and a hardwood swamp and semi-open wetland to the west. A gravel road crosses the site, leading to a house with outbuildings, lawn, and a pond. Telephone and power line rights-of-way are also present. A circular ditch/impoundment dominates the west-central portion of the area. The core of this site is the LaSage Unit of the Lower Wolf River Bottoms State Wildlife Area.

The primary natural community is a mature floodplain forest composed of large silver maple, swamp white oak, and green ash. There is at least one pocket of swampy red maple forest with buttonbush and sedge. The impounded area and small pond contain pondweeds (*Potamogeton spp.*), waterweed (*Elodea canadensis*), duckweeds (*Lemna spp.*), and white water crowfoot. The disturbed open to semi-open wetlands around the pond and impoundment support emergent aquatic and meadow communities of sedge, bur-reed, bulrush, reed canary grass, willow, and buttonbush with scattered young elm, silver and red maple, and green ash. The site contains good quality wet to wet-mesic forest.

The northeastern portion of the site supports a moderately disturbed mesic hardwood forest on a slightly elevated floodplain terrace. See Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site.

### Site Significance

This site contains an intact stand of older floodplain forest that supports several rare animals such as the Cerulean Warbler and Red-shouldered Hawk. In addition, a remnant stand of rich mesic hardwood forest is present sustaining at least one rare plant, the state-threatened handsome sedge (*Carex formosa*), a lush carpet of spring ephemerals, and regional rarities such as bladder-nut (*Staphylea trifolia*).

### Management Considerations

Maintenance and, where possible, expansion of stands of older forest with high canopy closure is critical if this and other sites featuring lowland hardwoods are to continue to support some of the sensitive forest interior species that are now present. Allowing the forests to mature, planning for large patches of mature forest, protecting wetlands to the east and west, and maintaining or establishing ecological connections with the Wolf River corridor both upstream and downstream are among the major management considerations. Control of invasive species like reed canary grass will enhance the values of the natural communities present and should be accounted for in the new master plan now under development.

### LASAGE BOTTOMS EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1991
<i>Alasmidonta marginata</i>	Elktoe	SC/H		1995
<i>Baetisca obesa</i>	A mayfly	SC/N		1999
<i>Buteo lineatus</i>	Red-shouldered hawk	THR		2000
<i>Dendroica cerulea</i>	Cerulean warbler	THR		2000

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
<i>Enochrus sayi</i>	A water scavenging beetle	SC/N		1999
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Hydrochara spangleri</i>	A water scavenger beetle	SC/N		2000
<i>Hydropsyche bidens</i>	A caddisfly	SC/N		1999
<i>Matus bicarinatus</i>	A predaceous diving beetle	SC/N		1999
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Procambarus acutus</i>	White river crawfish	SC/N		2000
<i>Stenelmis antennalis</i>	A riffle beetle	SC/N		1999
<i>Stenelmis fuscata</i>	A riffle beetle	SC/N		1999
<i>Stylurus notatus</i>	Elusive clubtail	SC/N		1999
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Plants				
<i>Carex formosa</i>	Handsome sedge	THR		1999
Communities				
Floodplain forest		NA		1999
Southern mesic forest		NA		2001

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.



## 13. Wolf River State Fishery Area

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Ecological Landscape: Southeast Glacial Plains  
Town-Range-Section: T22N-R 14E sec. 02, 03, 11  
Size: 1,380 acres

### **Site Description**

The Wolf River State Fishery Area consists of three small parcels on the north side of the Wolf River just west of New London in eastern Waupaca County. Topography is low and nearly level. Private lands that are predominantly wetlands surround the state property on three sides. State Highway 54 and a railroad corridor pass through the site. Uplands to the east and west of the Wolf River corridor are a combination of agricultural lands, abandoned agricultural lands, and developed and developing areas. The SFA is bracketed by the cities of Northport and New London, both of which are expected to experience increased residential development.

The easternmost unit is a 35-acre triangular parcel tucked in between the highway and railroad. It has been ditched and contains several small impoundments. Over half of the site is open wetland of reed canary grass, willow, buttonbush, and sedges. The ponds support stands of bulrush, cattail, sedge, and yellow water buttercup. There are small patches of silver maple forest with reed canary grass understories. The ditch banks are fringed with silver maple.

The central unit of 135 acres is situated on the north side of the Wolf River. The highway, railroad, and a ditch pass through the north end, which is the most disturbed portion of this unit, with an open reed canary grass meadow - emergent aquatic marsh and a semi-open silver maple swamp with a reed canary grass understory. A five-acre circular pond is located in the north-central end of the unit. The pond has a sedge border on the east end and a sedge-cattail border on the west end. There are several other smaller ponds scattered along the eastern boundary, with shallow water supporting sedges, buttonbush, bulrush, cattail, reed canary grass, duckweed, and yellow water buttercup. The greater part of this area supports a silver maple forest with green ash and swamp white oak that is in fair to good condition owing to its maturity and generally intact canopy. An interesting feature of the site is a mesic floodplain terrace forest of silver maple, basswood, red oak, swamp white oak, and green ash. This community supports many forest understory plants that are not presented in the silver maple-dominated stands within the floodplain proper.

The westernmost unit is about 32 acres in size and is situated on the east side of the confluence of Cedar Creek with the Wolf River. The vegetation includes willows, sedges, cattails, and the invasive weeds purple loosestrife and reed canary grass. See Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site

### **Site Significance**

This site contains examples of marsh, meadow, shrub swamp and floodplain forest communities of moderate to low quality. These provide habitat for many common native plants and animals and several that are rare, such as the state threatened Blanding's turtle.

### **Management Considerations**

From a community perspective, the greatest management potential lies in the central unit and the less disturbed forests emergent marshes. A high priority for protection would be adjacent forested areas between the central unit and New London and the central unit and Northport. Both areas are in good

condition and have a high probability of being fragmented or destroyed by future development. The Cedar Creek drainage requires additional inventory. Invasive plants are an important issue here as both purple loosestrife and reed canary grass are well-established and locally dominant. The impacts of the rights-of-way crossing these wetlands need further clarification, as they can adversely affect site hydrology, hinder animal movement, and serve as a source of pollutants.

#### WOLF RIVER STATE FISHERY AREA EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Alasmidonta marginata</i>	Elktoe	SC/H		1995
<i>Emydoidea blandingii</i>	Blanding's turtle	THR		1987
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Hydrobius melaenum</i>	A water scavenging beetle	SC/N		2000
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Plants				
<i>Carex gynocrates</i>	Northern bog sedge	SC		1931
<i>Platanthera orbiculata</i>	Large roundleaf orchid	SC		1931
Communities				
Floodplain forest		NA		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 14. Mukwa Bottoms

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Ecological Landscape: Southeast Glacial Plains  
Town-Range-Section: T22N-R 14E sec. 09-11, 15, 16, 21  
Size: 2,224 acres

### **Site Description**

Located in eastern Waupaca County just west of New London, this site is situated around the confluence of the Little Wolf River and Wolf River. Mukwa SWA includes most of the undeveloped land in the immediate area. Land uses in the surrounding landscape include agriculture (abandoned and active), residential development, and recreation.

The most extensive plant community is the silver maple-dominated floodplain forest that varies in condition from highly disturbed to excellent. There is also a disturbed, open to semi-open swamp/meadow of reed canary grass, purple loosestrife, and sedges, with scattered young silver maple and elm. There are high quality emergent aquatic and sedge meadow communities in abandoned oxbows, some of which support colonies of the state special concern cuckooflower and beds of wild rice. Upland edges and adjacent uplands support fragments of mesic sugar maple-basswood forest with colonies of the rare handsome sedge. Many of these upland forest stands have been logged, and have potential for future residential development.

East of the Wolf River the wetland communities are disturbed (e.g., by ditches and infestations of reed canary grass) but there are significant patches of emergent marsh (bulrushes, bur-reeds, spikerushes), sedge meadow, and shrub-carr. Scattered individuals and small groves of ash, elm, and silver maple forest also occur here. See Appendix C. Stream Priority # 2 and #4 for additional description of riverine features associated with this site.

### **Site Significance**

This site contains highly significant stands of floodplain forest and emergent marsh, supports rare plants and animals, and has excellent potential for expansion. The larger patches of mature closed canopy forest support rare, area-sensitive animals. This site occupies an integral portion of the lower Wolf River corridor and is contiguous with the vast bottomland forests downstream, to the south of Shaw's Landing. The corridor of the Little Wolf River is also of high significance, especially to aquatic life.

### **Management Considerations**

Protecting and, where possible, increasing the silver maple floodplain forest will protect water quality and provide additional habitat. Significant stands of floodplain forest to the south of the property warrant protection. Decreasing the invasives, especially reed canary grass and purple loosestrife, and increasing sedge meadow and emergent aquatic elements, are important considerations for managers. Other important natural communities include the floodplain of the Wolf River east of New London, the Cedar Creek Area to the north, and the numerous fragments of mesic sugar maple-basswood-oak forest adjacent to the floodplain. Expanding protection and allowing these forests to mature would benefit these communities and their associated flora and fauna.

## MUKWA BOTTOMS EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1991
<i>Alasmodonta marginata</i>	Elktoe	SC/H		1995
<i>Botaurus lentiginosus</i>	American bittern	SC/M		1984
<i>Buteo lineatus</i>	Red-shouldered hawk	THR		2000
<i>Chlidonias niger</i>	Black tern	SC/M		1984
<i>Coccyzus americanus</i>	Yellow-billed cuckoo	SC/M		1984
<i>Dendroica cerulea</i>	Cerulean warbler	THR		2000
<i>Emydoidea blandingii</i>	Blanding's turtle	THR		2000
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Etheostoma clarum</i>	Western sand darter	SC/N		1979
<i>Hetaerina titia</i>	Dark rubyspot	SC/N		1999
<i>Hydropsyche bidens</i>	A caddisfly	SC/N		1999
<i>Lioporeus triangularis</i>	A predaceous diving beetle	SC/N		1999
<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker	SC/M		1984
<i>Neurocordulia yamaskanensis</i>	Stygian shadowfly	SC/N		1999
<i>Nyctanassa violacea</i>	Yellow-crowned night-heron	THR		1984
<i>Ophiogomphus howei</i>	Pygmy snaketail	THR		1999
<i>Pandion haliaetus</i>	Osprey	THR		2000
<i>Pentagenia vittigera</i>	An ephemerid mayfly	SC/N		1992
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Poanes viator</i>	Broad-winged skipper	SC/N		2000
<i>Protonotaria citrea</i>	Prothonotary warbler	SC/M		2000
<i>Stenelmis fuscata</i>	A riffle beetle	SC/N		1999
<i>Stylurus notatus</i>	Elusive clubtail	SC/N		1992
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Plants				
<i>Cardamine pratensis</i>	Cuckooflower	SC		1999
<i>Carex formosa</i>	Handsome sedge	THR		1999
<i>Carex gynocrates</i>	Northern bog sedge	SC		1931
<i>Platanthera orbiculata</i>	Large roundleaf orchid	SC		1931
Communities				
Emergent aquatic		NA		1999
Floodplain forest		NA		1999
Southern mesic forest		NA		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 15. S&M Bottoms

Ecological Landscape: Central Lake Michigan Coastal  
 Town-Range-Section: T22N-R16E-sections 18, and 19  
 T22N-R15E- sections 13, 24, 25  
 Size: 1,448 acres

### Site Description

This site contains the Wolf River floodplain between bridge crossings at County Highways 'S' and 'M'. The primary natural community is floodplain forest, with mature stands composed primarily of silver maple, green ash, and swamp white oak. The more intact stands showed little evidence of recent disturbance. Patches of open and shrub-dominated wetlands occur away from the main channel, but were not surveyed due to access limitations. See Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site.

### Site Significance

S&M Bottoms contains several mature stands of good quality floodplain forest that support rare species such as Cerulean and Prothonotary Warblers. A high diversity of common native plants and animals was also recorded here during a canoe survey in the month of June.

### Management Considerations

The entire site is in private ownership, but this segment of the Wolf River corridor is worthy of additional protection as it connects other ecologically valuable stretches of the corridor. Increased protection for the site would provide stable and relatively secure habitat for some of the area sensitive species inhabiting the Lower Wolf River Bottomlands. The ability to protect water quality would also be enhanced. At this time developments along the river are localized, especially in the vicinity of the bridge crossings.

### S&M BOTTOMS EO's

	Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals					
	<i>Alasmidonta marginata</i>	Elktoe	SC/H		1995
	<i>Dendroica cerulea</i>	Cerulean Warbler	THR		2000
	<i>Epioblasma triquetra</i>	Snuffbox	END		1995
	<i>Notropis texanus</i>	Weed shiner	SC/N		1995
	<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
	<i>Protonotaria citrea</i>	Prothonotary Warbler	SC/M		2000
	<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Plants					
	<i>Carex gynocrates</i>	Northern bog sedge	SC		1931
Communities					
	Floodplain forest		NA		2000

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 16. Mosquito Hill / Liberty Bottoms

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Ecological Landscape: Central Lake Michigan Coastal  
Town-Range-Section: T22N-15E-sections 14-18, 19-23, 26-28  
Size: 3,420 acres

### **Site Description**

This site contains a 5 mile stretch of the Wolf River floodplain from the County Highway M bridge in Outagamie County west (downstream) to the city limits of New London. The primary community surveyed is an extensive floodplain forest lining both banks of the Wolf. Dominant trees are silver maple, swamp white oak, and green ash. Characteristic understory plants include buttonbush, wood nettle, gray-headed coneflower, cardinal flower, fowl manna grass, green dragon, hop sedge, muskingum sedge, Gray's sedge, and fox sedge. The forest occurs in a continuous strip typically one-half to one-quarter of a mile wide. Beyond the gallery forest lining the river banks there are extensive areas of shrub swamp and emergent marsh. Sloughs and old oxbows often hold beds of emergent and submergent aquatic macrophytes, including some large stands of wild rice and river bulrush.

Though the marsh habitats away from the floodplain were not surveyed intensively, several of the stands examined were dominated almost entirely by native wetland plants. Several rare birds, most notably Black Tern and Northern Harrier, were seen foraging over the marshes during the month of June. See Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site.

### **Site Significance**

The forested floodplain and the substantial emergent marsh and shrub swamp communities include stands in very good condition. Among the rare species documented here are Red-shouldered Hawk, Cerulean Warbler, Prothonotary Warbler, and Red-headed Woodpecker. Other noteworthy resident birds include Pileated Woodpecker, Barred Owl, Yellow-billed Cuckoo, Black Tern, Northern Harrier, and American Redstart. Few, if any, other sites in the local landscape have the potential to support the more sensitive species.

Three different ponds/wetlands sites were sampled here for aquatic invertebrates and each tended to have lots of species, many of which were not found in the other ponds. Combined, the taxa richness was 92 species which is very high for such a small area. These include four new county records and several rare species.

### **Management Considerations**

Additional protection efforts are warranted here. Only Mosquito Hill Nature Center near the western edge of the site, and small remnant fishery area (approximately 50 acres) along the Wolf River are publicly owned. Protection priorities included intact stands of mature floodplain forest, sloughs and oxbows with stands of emergent and submergent aquatics. There is a need for monitoring and control of invasive species such as reed canary grass and purple loosestrife. The marshes away from the forested river corridor merit additional survey work in the future.

## MOSQUITO HILL / LIBERTY BOTTOMS EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1991
<i>Alasmidonta marginata</i>	Elktoe	SC/H		1995
<i>Buteo lineatus</i>	Red-shouldered hawk	THR		2000
<i>Chlosyne gorgone</i>	Gorgone checker spot	SC/N		1991
<i>Dendroica cerulea</i>	Cerulean warbler	THR		2000
<i>Dubiraphia bivittata</i>	A dubiraphia riffle beetle	SC/N		2000
<i>Enochrus consortus</i>	A water scavenging beetle	SC/N		2000
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Erynnis lucilius</i>	Columbine dusky wing	SC/N		1991
<i>Euphyes bimacula</i>	Two-spotted skipper	SC/N		1989
<i>Euphyes dion</i>	Dion skipper	SC/N		1991
<i>Hesperocorixa semilucida</i>	A water boatman	SC/N		2000
<i>Hydrochara spangleri</i>	A water scavenger beetle	SC/N		2000
<i>Hydrometra martini</i>	A water measurer	SC/N		2000
<i>Ilybius ignarus</i>	Diving beetle	SC/N		2000
<i>Matus bicarinatus</i>	A predaceous diving beetle	SC/N		2000
<i>Meropleon ambifusca</i>	Newman's brocade	SC/N		1994
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Poanes viator</i>	Broad-winged skipper	SC/N		1992
<i>Procambarus acutus</i>	White river crawfish	SC/N		2000
<i>Protonotaria citrea</i>	Prothonotary warbler	SC/M		2000
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Communities				
	Floodplain forest	NA		2001
	Emergent aquatic – wild rice	NA		2000

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 17. Wolf River Corridor –Shaw's Landing to Fremont (Bayou Country)

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Ecological landscape:	Southeast Glacial Plains
Town-Range-Section:	T21N-R 13E sec. 01, 11-14, 24-26, 36; T21N-R 14E sec. 04-08, 18, 19, 30, 31; T22N-R 14E sec. 19-22, 27-33
Size:	12,861 acres

### **Site Description**

This eight-mile stretch of the Wolf River in southeastern Waupaca County is predominantly privately-owned. It was surveyed only by boat. Topography is nearly level with a gentle slope to the south. The Wolf River valley is up to five miles wide at this location, and the river meanders in a maze of sloughs, oxbows, channels, and shallow lakes. The adjacent uplands are used for agriculture and low density residential development. No bridges exist along this section of the river. Small floating cabins, moored along the riverbanks, are a common feature.

Extensive floodplain forest of silver maple, swamp white oak, and green ash vegetates much of the area. Areas of quiet water, including lakes, sloughs, oxbows, and stagnant areas in channels, support submergent aquatics such as water celery, spatterdock, water weed, water milfoil, pondweed, and hornwort. Open emergent wetlands are also present, as are larger inland wetlands, composed of cattails, reed canary grass, bulrushes, wild rice, willows, bur-reeds, common reed, and arrowheads. The invasives flowering rush, common reed, and purple loosestrife are locally established.

Three drainage lakes occur within this stretch of the Wolf River floodplain: Cincoe, Partridge Crop, and Partridge Lakes. Extensive beds of emergent marsh occur on the lake margins. Only the southern end of Partridge Lake is heavily developed, near the village of Fremont.

Of additional interest is an extensive conifer swamp dominated by tamarack, just to the east of “Templeton Bayou”. The biota is totally unlike that occurring elsewhere along the Lower Wolf and constitutes a unique opportunity for protection within this corridor. See Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site.

### **Site Significance**

This area encompasses over twenty square miles of extensive natural communities and provides secure habitat for many common and several rare native plants and animals. The large areas of lowland forest support rare animals such as Red-shouldered Hawk, Cerulean Warbler, and Prothonotary Warbler. Both Forster’s and Black Terns were frequently noted foraging in the marshes and sloughs. The large tamarack swamp just east of the river supports many species absent from the lowland hardwood forests, marshes, wet meadows, and shrub swamps that comprise the prevalent plant cover over most of this site

The Wolf River mainstem, including sites 16 and 17, was identified by The Nature Conservancy as a site of ecoregional significance, meaning conservation activities will be initiated or facilitated by The Nature Conservancy to ensure protection of the diversity of aquatic and wetland species found here. This site was one of four sites identified by The Nature Conservancy as conservation priorities within the Wolf River basin.



## Management Considerations

This site offers an excellent opportunity to preserve the native landscape on a large scale and is among the highest priorities for protection. Agricultural runoff and future development should be addressed. Habitat specialists, including extensive forest and extensive marsh species, warrant special attention here. Invasive species are a significant problem in some areas and should also receive attention.

### WOLF RIVER CORRIDOR –SHAW'S LANDING TO FREMONT EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1991
<i>Alasmodonta marginata</i>	Elktoe	SC/H		1995
<i>Ardea herodias</i>	Great blue heron	SC/M		2000
<i>Botaurus lentiginosus</i>	American bittern	SC/M		1984
<i>Buteo lineatus</i>	Red-shouldered hawk	THR		2000
<i>Chlidonias niger</i>	Black tern	SC/M		2000
<i>Cicindela patruela huberi</i>	A tiger beetle	SC/N		1999
<i>Coccyzus americanus</i>	Yellow-billed cuckoo	SC/M		1984
<i>Dendroica cerulea</i>	Cerulean warbler	THR		2000
<i>Epioblasma triquetra</i>	Snuffbox	END		1995
<i>Erimyzon sucetta</i>	Lake chubsucker	SC/N		1981
<i>Etheostoma clarum</i>	Western sand darter	SC/N		1981
<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker	SC/M		1984
<i>Nyctanassa violacea</i>	Yellow-crowned night-heron	THR		1984
<i>Opsopoeodus emiliae</i>	Pugnose minnow	SC/N		1981
<i>Pandion haliaetus</i>	Osprey	THR		2000
<i>Pentagenia vittigera</i>	An ephemerid mayfly	SC/N		1992
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Protonotaria citrea</i>	Prothonotary warbler	SC/M		2000
<i>Ranatra nigra</i>	A water scorpion	SC/N		2000
<i>Stylurus notatus</i>	Elusive clubtail	SC/N		2000
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Plants				
<i>Carex gynocrates</i>	Northern bog sedge	SC		1931
<i>Valeriana sitchensis ssp uliginosa</i>	Marsh valerian	THR		1944
Communities				
Emergent aquatic		NA		2000
Floodplain forest		NA		2000
Lake—oxbow		NA		2000
Northern wet forest		NA		2000
Shrub-carr		NA		2000
Tamarack swamp		NA		2000

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 18. Shaky Lake

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Ecological Landscape: Southeast Glacial Plain  
Town-Range-Section: T21N-R 15E sec. 07, 08  
Size: 725 acres

### Site Description

Located in southwestern Outagamie County, this site occupies a portion of a shallow depression within the drainage of an unnamed creek. There are significant natural features around the periphery of the depression and within the drainage, both above and below the lake. A core area of ca 220 acres has been designated a State Natural Area. Agricultural lands now surround the site, but residential development is increasing rapidly.

There are areas of open water in the depression, including Shaky Lake proper, that support emergent and submergent aquatic vegetation. Cattails are abundant. A floating mat dominated by wire-leaved sedge surrounds the lake and is in turn surrounded by tussock sedge meadow and black ash swamp. The sedge meadows and black ash swamp support colonies of cuckooflower (*Cardamine pratensis*).

A low, narrow ridge runs along the edge of the depression. The eastern portion supports a small but intact forest of white pine, basswood, paper birch, red maple, green ash, and oaks. Just to the east of this is a depression with a hardwood swamp of silver maple, red maple, American elm (mostly saplings – Dutch elm disease killed most of the trees), and ashes. The remainder of the ridge and the adjacent slopes are vegetated with an early successional basswood-dominated forest.

### Site Significance

The wetland communities found on this property (listed below) are diverse, in good condition, and represent regionally rare types. Rare species are present, representing a variety of taxa.

### Management Considerations

The continued protection of high quality wetland communities and the adjoining upland ridge is an important management consideration and should be given high priority. Additional protection may be needed for some of the adjoining tracts. Development within adjoining forest remnants could have adverse impacts to the natural communities within the site. Protection of site hydrology is a high priority. The water level has risen recently, possibly due to beaver activities, inundating portions of the lowland forest, shrub swamp, and wire-leaved sedge meadow and apparently increasing the prevalence of cattails. Efforts to control aggressive invasive plants, especially purple loosestrife, should continue.

### SHAKY LAKE EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Clemmys insculpta</i>	Wood turtle	THR		1987
<i>Empidonax virens</i>	Acadian flycatcher	THR		2000
<i>Ilybius ignarus</i>	Diving beetle	SC/N		2000
<i>Rhantus sinuatus</i>	A predaceous diving beetle	SC/N		2000
Plants				
<i>Cardamine pratensis</i>	Cuckooflower	SC		1999
<i>Medeola virginiana</i>	Indian cucumber-root	SC		1968
Communities				
Emergent aquatic		NA		1999
Hardwood swamp		NA		1999

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Lake--shallow, hard, seepage		NA		1999
Northern sedge meadow		NA		1999
Northern wet forest		NA		1999
Southern dry-mesic forest		NA		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 19. Rat River

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Ecological Landscape: Southeast Glacial Plains  
Town-Range-Section: T20N-R 14E sec. 13, 23, 24; T20N-R 15E sec. 01-03, 07-11, 14-18;  
T20N-R 16E sec. 04-09  
Size: 6,342 acres

### **Site Description**

Located in northern Winnebago County, this site includes an eight-mile, free flowing stretch of the Rat River, a tributary of the Wolf River. Much of the wetland acreage within this corridor is within the Rat River SWA. Agricultural land and residential developments occupy the uplands adjoining the property.

The major natural feature is the Rat River, a shallow, slow, meandering, hard water stream, and a large emergent marsh bordering much of the river's length. The marsh dominants include cattails, bulrushes, bur-reeds, arrowheads, and spike-rushes. Stands of wet meadow are also present, often in a zone between the marsh and shrub-carr and hardwood swamp communities. The wet meadows are composed of tussock and lake sedges, Canada bluejoint grass, and wetland forbs such as swamp milkweed, joe-pye-weed, boneset, and monkey flower. Reed canary grass is a significant problem, especially in formerly grazed wet meadows and some shallow marshes, and in stands of hardwood swamp that had been heavily logged or grazed.

Other wetland vegetation within or adjacent to the site includes ash-dominated hardwood swamp, shrub-carr, alder thicket, and small patches of tamarack.

There are also old fields that were formerly used for agricultural purposes. A community that appears to be reclaiming former old field and pasture is a shrub-carr-wet-meadow wetland type, now composed of dogwood, willow, sedge, and bluegrass. There are small fragments of mesic forest around the upland edges of the wetlands. Most of these upland forest remnants are disturbed, but several are in good condition. A disturbed hardwood swamp community, composed of bur oak, green ash, black ash, elm, silver maple, with abundant reed canary grass in the understory, represents the forested wetlands on the site. The best example of the hardwood swamp community is located east of Hillcrest Road, where very little reed canary grass is present. Canopy dominants in this community include silver maple, swamp white oak, bur oak, green ash, basswood, and white cedar. This stand grades upslope into a fragment of mesic hardwood forest, and contains several undisturbed springs.

Small, scattered patches of mesic prairie with big bluestem, prairie dock, golden alexanders, and prairie sunflower are found along roadsides.

A variety of butterfly habitats was noted in the area along Shady Lane, including dry open areas and wet areas, and these patches supported high butterfly diversity.

### **Site Significance**

The emergent marsh is extensive and supports rare as well as common marsh-dwelling species. Notable resident birds include Virginia Rail, Sora, Marsh Wren, Black Tern, Black-crowned Night Heron, and Least Bittern. Golden-winged Warblers were recorded at several locations in dense patches of tall wetland shrubs with scattered trees. The fragments of tall grass prairie occurring within the site boundary are at the northern range limit for this community type. Remnants of mesic prairie of any size are now very rare throughout Wisconsin. The Rat River area was the only site surveyed in 1999 where a

rare mammal, the Arctic shrew, was documented. The presence of high quality shrub-carr here is thought to be highly significant for this species.

### **Management Considerations**

Management issues include: the restoration of hydrology, reduction of the presence of invasive plants in the meadows and marshes, allowing forest patches of swamp hardwoods and mesic hardwoods to mature, increasing the acreage of prairie by conducting controlled burns and, where feasible, planting locally collected seed, and maintaining acreages of shrub-carr habitat at selected sites. Abandoned agricultural lands and lands in the conservation reserve program (CRP) adjoining or near the wetlands have the potential to support significant populations of grassland birds.

### **RAT RIVER EO's**

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Chlidonias niger</i>	Black tern	SC/M		2001
<i>Fundulus diaphanus</i>	Banded killifish	SC/N		1974
<i>Fundulus diaphanus</i>	Banded killifish	SC/N		1974
<i>Ixobrychus exilis</i>	Least bittern	SC/M		2000
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Poanes viator</i>	Broad-winged skipper	SC/N		2000
<i>Sorex arcticus</i>	Arctic shrew	SC/N		1999
Plants				
<i>Carex formosa</i>	Handsome sedge	THR		2001
Communities				
Emergent aquatic		NA		2000
Northern mesic forest		NA		1999
Northern wet-mesic forest		NA		1982
Southern hardwood swamp		NA		1999
Southern sedge meadow		NA		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 20. Lower Wolf River Marshes (Wolf River State Wildlife Area)

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Ecological Landscape: Southeast Glacial Plains  
Town-Range-Section: T20N-R 14E sec. 02, 03, 10, 11, 14-16, 22, 23  
Size: 4,261 acres

### **Site Description**

Located in northwest Winnebago County, this site encompasses a vast marsh bordering the lowermost stretches of the Wolf River. The two slightly disjunct units of the Wolf River State Wildlife Area are contained within the site boundary. Topography is low and nearly level, with a barely perceptible slope toward the south.

The northeastern part of the site is dominated by reed canary grass, with some areas of willows and cat-tails. Ditches and impoundments are prominent. Around the site periphery there are scattered patches of hardwood swamp composed of bur oak, green ash, silver maple, basswood, and aspen, as well as both active and fallow agricultural lands.

The southern portion of the site includes a huge emergent marsh of cattails, bulrushes, spike-rushes, bur-reeds, arrowheads, common reed, and, locally, wild rice. Large sloughs within this marsh support extensive beds of floating-leaved and submergent aquatic macrophytes, such as pondweeds, hornwort, water celery, waterweed, spatterdock, and water milfoils. American lotus beds occur in some of the protected shallow bays. Linear strips of silver maple, green ash, box elder, and other swamp hardwoods occur along certain stretches of the lower Wolf River and on some of the spoilbanks bordering old ditches. See Appendix C. Stream Priority # 2 for additional description of riverine features associated with this site

### **Site Significance**

Owing to its size and generally good quality, this site contains an exceptionally significant marsh. Bird life is diverse and includes many rare and declining species. Among the latter are Forster's and Black Terns, Least and American Bitterns, Northern Harrier, and Common Moorhen. At least one rare plant, the state threatened handsome sedge, occurs here. Some of the adjoining open uplands are not currently used for agricultural purposes. These old field habitats are used by many grassland birds, including species experiencing regional declines such as the Grasshopper Sparrow, Bobolink, Eastern Meadowlark, and Dickcissel.

### **Management Considerations**

The marsh contains an extensive emergent/submergent marsh community of very high value. Managing the site to maintain these aquatic macrophyte beds in the vicinity of the slough in a natural condition would protect the value of the community. A number of invasive species are present, including purple loosestrife, reed canary grass, common reed, and flowering rush. These should be monitored and controlled where feasible. In a few areas, potholes have been created to provide waterfowl habitat. Such sites are possible entry points for invasive plants. Additional breeding bird surveys are warranted, as poor weather and the difficulty in accessing some of the interior marsh areas hampered some of the survey efforts. The site also has some wet to wet-mesic forest invertebrate potential.

## LOWER WOLF RIVER MARSHES (WOLF RIVER STATE WILDLIFE AREA) EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1978
<i>Botaurus lentiginosus</i>	American bittern	SC/M		2001
<i>Chlidonias niger</i>	Black tern	SC/M		2001
<i>Erimyzon sucetta</i>	Lake chubsucker	SC/N		1979
<i>Fundulus diaphanus</i>	Banded killifish	SC/N		1974
<i>Luxilus chrysocephalus</i>	Striped shiner	END		UNK
<i>Moxostoma valenciennesi</i>	Greater redhorse	THR		1974
<i>Notropis anogenus</i>	Pugnose shiner	THR		1963
<i>Nycticorax nycticorax</i>	Black-crowned night-heron	SC/M		2001
<i>Opsopoeodus emiliae</i>	Pugnose minnow	SC/N		1978
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Sterna forsteri</i>	Forster's tern	END		1984
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995
Plants				
<i>Cardamine pratensis</i>	Cuckooflower	SC		1999
Communities				
Emergent aquatic		NA		1999
Emergent aquatic - wild rice		NA		1999
Floodplain forest		NA		1999

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 21. Winchester Meadows

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Ecological landscape: Southeast Glacial Plains  
Town-Range-Section: T20N-R15E- parts of sections 19, 20, 30, and 31  
Size: 941

### **Site Description**

Winchester Meadows encompasses extensive sedge meadow and emergent marsh communities on muck soils of the Willette series. The meadow is unique in this part of the Lower Wolf Basin for its floristic composition and size. The eastern border of the meadow is dominated by tussock sedge and Canada bluejoint grass, with spotted joe-pye-weed, swamp milkweed, and panicked aster among the common associates. The interior meadow is dominated by the wire-leaved woolly sedge (*Carex lasiocarpa*). Associates include marsh bellflower, water horsetail, marsh fern, blue flag iris, soft-stem bulrush, and many additional sedges. Shrub cover is generally low in the meadow-marsh interior, with willows, especially slender willow, the most common species.

The meadow grades into an emergent marsh dominated by bulrushes, lake sedge, cattails, and, locally, common reed. Arrowhead and marsh cinquefoil are common associates.

Other communities present include shrub-carr, dominated by willows and dogwoods, and southern hardwood swamp, composed mostly of willow and ashes.

Animals noted during the month of June included Marsh and Sedge Wrens, Northern Harrier, American Bittern, Forster's Tern (foraging), and Purple Martin. Yellow Rails have been reported here recently in late spring (May), but have not yet been documented during the breeding season.

Surrounding uplands are, or have been, used for agricultural purposes. Some of this land is now fallow, and residential development is increasing in the area.

### **Site Significance**

The "wire-leaved" meadow community (northern sedge meadow) is of high significance owing to its size, composition, and generally undisturbed nature. Arguably this is the best such wet meadow in the entire Wolf basin. Certainly it is the best example of the type in the lower basin. Portions of the emergent marsh and southern sedge meadow communities are also in good condition and in aggregate have high potential to support sensitive species. In addition to the many common and characteristic plants and animals that are resident, the site currently supports rare plants and rare animals.

### **Management Considerations**

This privately owned site is a high priority for protection, as it is large and contains the best example of a wire-leaved (northern) sedge meadow community in the entire basin. Hydrologic function of the site needs to be better understood here, as it is important that the meadows not convert to emergent marsh communities due to artificially elevated water levels. Hydrologic connections to Lake Poygan to the southwest and Lake Winneconne to the southeast appear to be present via ditched wetlands. Invasive plants, including purple loosestrife, reed canary grass, and common reed, are locally established and should be carefully monitored. Additional surveys for rare birds such as Yellow Rail and LeConte's Sparrow, and selected invertebrate groups, have high potential for yielding valuable information.



## WINCHESTER MEADOWS EO's

Scientific Name	Common Name	SRANK	GRANK	State Status	Federal Status	Lastobs Date
Plants						
<i>Triglochin maritima</i>	Common bog arrow-grass	S3	G5	SC		2000
Communities						
Emergent aquatic				NA		2000
Northern sedge meadow		S3	G4	NA		2000

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## 22. Piacenza Marsh

Ecological Landscape: Southeast Glacial Plains  
Town-Range-Section: T20N-R15E-sections 29, 31-33  
Size: 369 acres

### Site Description

This site contains a substantial acreage of emergent and submergent marsh located on the northcentral shore of Lake Winneconne. Marsh dominants include cattails, bulrushes, arrowheads, and common reed. Beds of wild rice occur in the sheltered waters of the central embayment.

### Site Significance

The extensive marshes are an important portion of the remnant marsh complex associated with the lower Wolf River and the Winnebago Pool lakes. The marshes support many common and characteristic wetland species, as well as rare aquatic animals. Also significant is the direct hydrological connection of this site with the Winchester Meadows complex situated one mile to the northwest.

### Management Considerations

This site was briefly examined during a 1999 survey via powerboat. More detailed survey information is desirable, but the site is clearly important for the extensive open wetland communities it contains. Monitoring, and as appropriate, controlling invasive species is an important consideration here, as is monitoring annual changes to the extent of the marshes due to wave and ice action.

### PIACENZA MARSH EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Erimyzon sucetta</i>	Lake chubsucker	SC/N		1979
<i>Fundulus diaphanus</i>	Banded killifish	SC/N		1974
<i>Luxilus chrysocephalus</i>	Striped shiner	END		UNK
<i>Moxostoma valenciennesi</i>	Greater redhorse	THR		1974
<i>Notropis anogenus</i>	Pugnose shiner	THR		1963
<i>Opsopoeodus emiliae</i>	Pugnose minnow	SC/N		1978
Communities				
Emergent aquatic - wild rice		NA		1999
Northern sedge meadow		NA		2000

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 23. Clark's Point

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Ecological landscape: Southeast Glacial Plains  
Town-Range-Section: T20N-R 15E sec. 19, 20, 29-33  
Size: 282 acres

### Site Description

This privately owned site is located on the northeast end of Lake Winneconne in northcentral Winnebago County. The property was inventoried by boat only. The surrounding uplands include agricultural fields, abandoned agricultural lands, and residential developments. The property borders Lake Winneconne to the south and additional wetlands to the north and west (see sites #21 and 22).

An estuary-like bay of Lake Winneconne extends into the cattail marsh along the shoreline and supports dense beds of submergent aquatics including pondweeds, spatterdock, and hornwort. A narrow fringe of other emergents, including wild rice, bulrushes, arrowhead, and common reed, occurs around the edges of the open water and borders the cattail marsh.

### Site Significance

This site contains examples of several natural communities of moderate quality and provides secure habitat for many common native plants and animals. Rare species such as Forster's and Black Terns forage here. Detailed survey work was not possible due to private ownership concerns and limited time. Therefore significance determination is preliminary.

### Management Considerations

This site was briefly examined during a 1999 survey via powerboat. More detailed survey information is desirable, but the site is clearly important for the extensive open wetland communities it contains. Monitoring, and as appropriate, controlling invasive species is an important consideration here, as is monitoring annual changes to the extent of the marshes due to wave and ice action.

### CLARK'S POINT EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Erimyzon sucetta</i>	Lake chubsucker	SC/N		1979
<i>Fundulus diaphanus</i>	Banded killifish	SC/N		1974
<i>Luxilus chrysocephalus</i>	Striped shiner	END		UNK
<i>Moxostoma valenciennesi</i>	Greater redhorse	THR		1974
<i>Notropis anogenus</i>	Pugnose shiner	THR		1963
<i>Opsopoeodus emiliae</i>	Pugnose minnow	SC/N		1978

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.

## 24. Poygan Islands

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Ecological landscape: Southeast Glacial Plains

Town-Range-Section: T19N-R14E- sections 1, 2, 4, and 5

Size: 155 acres

### Site Description

This site consists of scattered small islands of emergent marsh within Lake Poygan, approximately one mile from the mouth of the Wolf River. The emergent stands have been established on piles of rock dropped into the shallow but exposed lake basin to provide a stable substrate and break wave action. The dominant plant is common reed.

### Significance

These isolated islands of emergent marsh provide critical nesting habitat for the state-endangered Forster's Tern. Several hundred pairs have nested here annually in recent years, but adverse weather conditions can drop nesting success to 0. In 2001 the entire colony was flooded out (pers. Comm., A. Techlow 3/2002).

### Management Considerations

The present Lake Poygan marshes are a vestigial remnant of a vast marsh that historically filled much of the lake basin. Exposure to wind, wave, and ice action, and heavy use of the lake by recreational boaters, present significant challenges to maintaining these small marsh remnants as viable tern habitat.

### POYGAN ISLANDS EO's

Scientific Name	Common name	State Status	Federal Status	Lastobs Date
Animals				
<i>Acipenser fulvescens</i>	Lake sturgeon	SC/H		1978
<i>Erimyzon sucetta</i>	Lake chubsucker	SC/N		1979
<i>Fundulus diaphanus</i>	Banded killifish	SC/N		1974
<i>Luxilus chrysocephalus</i>	Striped shiner	END		UNK
<i>Moxostoma valenciennesi</i>	Greater redhorse	THR		1974
<i>Notropis anogenus</i>	Pugnose shiner	THR		1963
<i>Opsopoeodus emiliae</i>	Pugnose minnow	SC/N		1978
<i>Pleurobema sintoxia</i>	Round pigtoe	SC/H		1995
<i>Sterna forsteri</i>	Forster's tern	END		2000
<i>Tritogonia verrucosa</i>	Buckhorn	THR		1995

**WI Status:** Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. **Federal Status:** Federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened. The complete NHI listed is provided in Appendix Q.